

SEQUENCE LISTING

<110> The Government of the United States of America . . .

Fields & Khudyakov

<120> Synthetic Peptides Immunoreactive With Hepatitis A
Virus Antibodies

<130> 14114.0342U2

<140> PCT/US00/19267

<141> 2000-07-14

<150> 60/144,412

<151> 1999-07-15

<160> 94

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 1

Gly	Leu	Asp	His	Ile	Leu	Ser	Leu	Ala	Asp	Ile	Glu	Glu	Glu	Gln	Met
1				5					10					15	

Ile	Gln	Ser	Val	Gln
			20	

<210> 2

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 2

Asp	Arg	Thr	Ala	Val	Thr	Gly	Ala	Ser	Tyr	Phe	Thr	Ser	Val	Asp	Gln
1				5					10					15	

Ser	Ser	Val	His	Gln
			20	

<210> 3

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 3

Glu Val Gly Ser His Gln Val Glu Pro Leu Arg Thr Ser Val Asp Lys
1 5 10 15

Pro Gly Ser Lys Gln
20

<210> 4

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 4

Glu Pro Leu Arg Thr Ser Val Asp Lys Pro Gly Ser Lys Lys Thr Gln
1 5 10 15

Gly Glu Lys Phe Gln
20

<210> 5

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 5

Asp Lys Pro Gly Ser Lys Lys Thr Gln Gly Glu Lys Phe Phe Leu Ile
1 5 10 15

His Ser Ala Asp Gln
20

<210> 6

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 6

Leu Tyr Asn Glu Gln Phe Ala Val Gln Gly Leu Leu Arg Tyr His Thr
1 5 10 15

Tyr Ala Arg Phe Gln
20

<210> 7
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 7
His Thr Tyr Ala Arg Phe Gly Ile Glu Ile Gln Val Gln Ile Asn Pro
1 5 10 15

Thr Pro Phe Gln
20

<210> 8
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 8
Ile Asn Pro Thr Pro Phe Gln Gln Gly Gly Leu Ile Cys Ala Met Val
1 5 10 15

Pro Gly Asp Gln
20

<210> 9
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 9
His Phe Lys Asp Pro Gln Tyr Pro Val Trp Glu Leu Thr Ile Arg Val
1 5 10 15

Trp Ser Glu Leu Gln
20

<210> 10
<211> 21
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP2 and VP4 Peptides

<400> 10
Asn Ile Gly Thr Gly Thr Ser Ala Tyr Thr Ser Leu Asn Val Leu Ala
1 5 10 15

Arg Phe Thr Asp Gln
20

<210> 11
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP3 Peptide

<400> 11
Ser Asp Pro Ser Gln Gly Gly Gly Ile Lys Ile Thr His Phe Thr Thr
1 5 10 15

Trp Thr Ser Ile Gln
20

<210> 12
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP3 Peptide

<400> 12
Gly Gly Ile Lys Ile Thr His Phe Thr Thr Trp Thr Ser Ile Pro Thr
1 5 10 15

Leu Ala Ala Gln
20

<210> 13
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP3 Peptide

<400> 13
Gln Phe Pro Phe Asn Ala Ser Asp Ser Val Gly Gln Gln Ile Lys Val
1 5 10 15

Ile Pro Val Asp Gln
20

<210> 14
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 14
 Phe Asn Ala Ser Asp Ser Val Gly Gln Gln Ile Lys Val Ile Pro Val
 1 5 10 15

Asp Pro Tyr Phe Gln
 20

<210> 15
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 15
 Ser Asp Ser Val Gly Gln Gln Ile Lys Val Ile Pro Val Asp Pro Tyr
 1 5 10 15

Phe Phe Gln Met Gln
 20

<210> 16
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 16
 Ile Lys Val Ile Pro Val Asp Pro Tyr Phe Phe Gln Met Thr Asn Thr
 1 5 10 15

Asn Pro Asp Gln Gln
 20

<210> 17
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 17

Lys Cys Ile Thr Ala Leu Ala Ser Ile Cys Gln Met Phe Cys Phe Trp
 1 5 10 15

Arg Gly Asp Leu Gln
 20

<210> 18

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 18

Phe Trp Arg Gly Asp Leu Val Phe Asp Phe Gln Val Phe Pro Thr Lys
 1 5 10 15

Tyr His Ser Gly Gln
 20

<210> 19

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 19

Phe Asp Phe Gln Val Phe Pro Thr Lys Tyr His Ser Gly Arg Leu Leu
 1 5 10 15

Phe Cys Phe Val Gln
 20

<210> 20

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 20

Phe Pro Thr Lys Tyr His Ser Gly Arg Leu Leu Phe Cys Phe Val Pro
 1 5 10 15

Gly Asn Glu Leu Gln
 20

<210> 21

<211> 21

<212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 21
 Gly Ile Thr Leu Lys Gln Ala Thr Thr Ala Pro Cys Ala Val Met Asp
 1 5 10 15
 Ile Thr Gly Val Gln
 20

<210> 22
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP3 Peptide

<400> 22
 Val Ala Ser His Val Arg Val Asn Val Tyr Leu Ser Ala Ile Asn Leu
 1 5 10 15
 Glu Cys Phe Ala Gln
 20

<210> 23
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 23
 Thr Thr Val Ser Thr Glu Gln Asn Val Pro Asp Pro Gln Val Gly Ile
 1 5 10 15
 Thr Thr Met Lys Gln
 20

<210> 24
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 24
 Gln Asn Val Pro Asp Pro Gln Val Gly Ile Thr Thr Met Lys Asp Leu
 1 5 10 15

Lys Gly Lys Ala Gln
20

<210> 25
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 25
Asn Arg Gly Lys Met Asp Val Ser Gly Val Gln Ala Pro Val Gly Ala
1 5 10 15

Ile Thr Thr Ile Gln
20

<210> 26
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 26
Ile Thr Thr Ile Glu Asp Pro Val Leu Ala Lys Lys Val Pro Glu Thr
1 5 10 15

Phe Pro Glu Leu Gln
20

<210> 27
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 27
Glu Asp Pro Val Leu Ala Lys Lys Val Pro Glu Thr Phe Pro Glu Leu
1 5 10 15

Lys Pro Gly Glu Gln
20

<210> 28
<211> 21
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 28

Ala Lys Lys Val Pro Glu Thr Phe Pro Glu Leu Lys Pro Gly Glu Ser
1 5 10 15

Arg His Thr Ser Gln
20

<210> 29

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 29

Phe Pro Glu Leu Lys Pro Gly Glu Ser Arg His Thr Ser Asp His Met
1 5 10 15

Ser Ile Tyr Lys Gln
20

<210> 30

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 30

Asp His Met Ser Ile Tyr Lys Phe Met Gly Arg Ser His Phe Leu Cys
1 5 10 15

Thr Phe Thr Phe Gln
20

<210> 31

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
VP1 Peptide

<400> 31

His Phe Leu Cys Thr Phe Thr Phe Asn Ser Asn Asn Lys Glu Tyr Thr
1 5 10 15

Phe Pro Ile Thr Gln
20

<210> 32
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 32
 Thr Pro Val Gly Leu Ala Val Asp Thr Pro Trp Val Glu Lys Glu Ser
 1 5 10 15

Ala Leu Ser Ile Gln
 20

<210> 33
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 33
 Leu Ser Phe Ser Cys Tyr Leu Ser Val Thr Glu Gln Ser Glu Phe Tyr
 1 5 10 15

Phe Pro Arg Ala Gln
 20

<210> 34
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 34
 Ser Val Thr Glu Gln Ser Glu Phe Tyr Phe Pro Arg Ala Pro Leu Asn
 1 5 10 15

Ser Asn Ala Met Gln
 20

<210> 35
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 35

Pro Leu Asn Ser Asn Ala Met Leu Ser Thr Glu Ser Met Met Ser Arg
 1 5 10 15

Ile Ala Ala Gly Gln
 20

<210> 36

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 36

Met Ser Arg Ile Ala Ala Gly Asp Leu Glu Ser Ser Val Asp Asp Pro
 1 5 10 15

Arg Ser Glu Glu Gln
 20

<210> 37

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 37

Ala Gly Asp Leu Glu Ser Ser Val Asp Asp Pro Arg Ser Glu Glu Asp
 1 5 10 15

Lys Arg Phe Glu Gln
 20

<210> 38

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 VP1 Peptide

<400> 38

Val Asp Asp Pro Arg Ser Glu Glu Asp Lys Arg Phe Glu Ser His Ile
 1 5 10 15

Glu Cys Arg Lys Gln
 20

<210> 39

<211> 21

<212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P2A Peptide

<400> 39

Ser His Ile Glu Cys Arg Lys Pro Tyr Lys Glu Leu Arg Leu Glu Val
 1 5 10 15

Gly Lys Gln Arg Gln
 20

<210> 40

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P2A Peptide

<400> 40

Pro Tyr Lys Glu Leu Arg Leu Glu Val Gly Lys Gln Arg Leu Lys Tyr
 1 5 10 15

Ala Gln Glu Glu Gln
 20

<210> 41

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P2A Peptide

<400> 41

Gln Arg Leu Lys Tyr Ala Gln Glu Glu Leu Ser Asn Glu Val Leu Pro
 1 5 10 15

Pro Pro Arg Lys Gln
 20

<210> 42

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P2A Peptide

<400> 42

Val Leu Pro Pro Pro Arg Lys Met Lys Gly Leu Phe Ser Gln Ala Lys
 1 5 10 15

Ile Ser Leu Phe Gln
20

<210> 43
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 43
Phe Ser Gln Ala Lys Ile Ser Leu Phe Tyr Thr Glu Glu His Glu Ile
1 5 10 15

Met Lys Phe Ser Gln
20

<210> 44
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 44
Lys Val Asn Phe Pro His Gly Met Leu Asp Leu Glu Glu Ile Ala Ala
1 5 10 15

Asn Ser Lys Asp Gln
20

<210> 45
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 45
Asp Leu Glu Glu Ile Ala Ala Asn Ser Lys Asp Phe Pro Asn Met Ser
1 5 10 15

Glu Thr Asp Leu Gln
20

<210> 46
<211> 20
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 46

Lys Ile Asn Leu Ala Asp Arg Met Leu Gly Leu Ser Gly Val Gln Glu
1 5 10 15

Ile Lys Glu Gln
20

<210> 47

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 47

Gln Arg Leu Lys Tyr Ala Gln Glu Glu Leu Ser Asn Glu Val Leu Pro
1 5 10 15

Pro Pro Arg Lys Met Lys Gly Leu Phe Gln
20 25

<210> 48

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2A Peptide

<400> 48

Trp Leu Asn Pro Lys Lys Ile Asn Leu Ala Asp Arg Met Leu Gly Leu
1 5 10 15

Ser Gly Val Gln Glu Ile Lys Glu Gln
20 25

<210> 49

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2B Peptide

<400> 49

Val Ile Gln Gln Leu Asn Gln Asp Glu His Ser His Ile Ile Gly Leu
1 5 10 15

Leu Arg Val Met Gln
20

<210> 50
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 50
 Asn Ile Leu Lys Asp Asn Gln Gln Lys Ile Glu Lys Ala Ile Glu Glu
 1 5 10 15
 Ala Asp Glu Phe Gln
 20

<210> 51
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 51
 Leu Gly Ser Ile Asn Gln Ala Met Val Thr Arg Cys Glu Pro Val Val
 1 5 10 15
 Cys Tyr Leu Tyr Gln
 20

<210> 52
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 52
 Arg Cys Glu Pro Val Val Cys Tyr Leu Tyr Gly Lys Arg Gly Gly Gly
 1 5 10 15
 Lys Ser Leu Thr Gln
 20

<210> 53
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 53

Thr	Lys	Pro	Val	Ala	Ser	Asp	Tyr	Trp	Asp	Gly	Tyr	Ser	Gly	Gln	Leu
1				5					10					15	

Val	Cys	Ile	Ile	Gln
				20

<210> 54

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2C Peptide

<400> 54

Val	Ser	Gly	Cys	Pro	Met	Arg	Leu	Asn	Met	Ala	Ser	Leu	Glu	Glu	Lys
1				5					10					15	

Gly	Arg	His	Phe	Gln
				20

<210> 55

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2C Peptide

<400> 55

Leu	Asn	Met	Ala	Ser	Leu	Glu	Glu	Lys	Gly	Arg	His	Phe	Ser	Ser	Pro
1				5					10					15	

Phe	Ile	Ile	Ala	Gln
				20

<210> 56

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P2C Peptide

<400> 56

Asn	Pro	Ser	Pro	Lys	Thr	Val	Tyr	Val	Lys	Glu	Ala	Ile	Asp	Arg	Arg
1				5					10					15	

Leu	His	Phe	Lys	Gln
				20

<210> 57
 <211> 21
 <212> PRT/
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 57
 Val Lys Glu Ala Ile Asp Arg Arg Leu His Phe Lys Val Glu Val Lys
 1 5 10 15

Pro Ala Ser Phe Gln
 20

<210> 58
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 58
 Val Lys Pro Ala Ser Phe Phe Lys Asn Pro His Asn Asp Met Leu Asn
 1 5 10 15

Val Asn Leu Ala Gln
 20

<210> 59
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 59
 Lys Asn Pro His Asn Asp Met Leu Asn Val Asn Leu Ala Lys Thr Asn
 1 5 10 15

Asp Ala Ile Lys Gln
 20

<210> 60
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 60

Leu Ala Lys Thr Asn Asp Ala Ile Lys Asp Met Ser Cys Val Asp Leu
 1 5 10 15

Ile Met Asp Gly Gln
 20

<210> 61

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P2C Peptide

<400> 61

Val Met Thr Val Glu Ile Arg Lys Gln Asn Met Thr Glu Phe Met Glu
 1 5 10 15

Leu Trp Ser Gln
 20

<210> 62

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3A Peptide

<400> 62

Ser Gln Gly Ile Ser Asp Asp Asp Asn Asp Ser Ala Val Ala Glu Phe
 1 5 10 15

Phe Gln Ser Phe Gln
 20

<210> 63

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3A Peptide

<400> 63

Asp Ser Ala Val Ala Glu Phe Phe Gln Ser Phe Pro Ser Gly Glu Pro
 1 5 10 15

Ser Asn Ser Lys Gln
 20

<210> 64

<211> 21
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3A Peptide

<400> 64

Phe Gln Ser Phe Pro Ser Gly Glu Pro Ser Asn Ser Lys Leu Ser Gly
 1 5 10 15

Phe Phe Gln Ser Gln
 20

<210> 65
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3A Peptide

<400> 65

Ser Ala Val Ala Glu Phe Phe Gln Ser Phe Pro Ser Gly Glu Pro Ser
 1 5 10 15

Asn Ser Lys Leu Ser Gly Phe Phe Gln
 20 25

<210> 66
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3B Peptide

<400> 66

His Gly Val Thr Lys Pro Lys Gln Val Ile Lys Leu Asp Ala Asp Pro
 1 5 10 15

Val Glu Ser Gln
 20

<210> 67
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 67

Gly Leu Val Arg Lys Asn Leu Val Gln Phe Gly Val Gly Glu Lys Asn
 1 5 10 15

Gly Cys Val Arg Gln
 20

<210> 68

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 68

Asp Val Val Leu Met Lys Val Pro Thr Ile Pro Lys Phe Arg Asp Ile
 1 5 10 15

Thr Gln His Phe Gln
 20

<210> 69

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 69

Met Glu Glu Lys Ala Thr Tyr Val His Lys Lys Asn Asp Gly Thr Thr
 1 5 10 15

Val Asp Leu Thr Gln
 20

<210> 70

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 70

Lys Asn Asp Gly Thr Thr Val Asp Leu Thr Val Asp Gln Ala Trp Arg
 1 5 10 15

Gly Lys Gly Glu Gln
 20

<210> 71
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 71

Arg Gly Lys Gly Glu Gly Leu Pro Gly Met Cys Gly Gly Ala Leu Val
 1 5 10 15

Ser Ser Asn Gln
 20

<210> 72
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3C Peptide

<400> 72

Val Ala Lys Leu Val Thr Gln Glu Met Phe Gln Asn Ile Asp Lys Lys
 1 5 10 15

Ile Glu Ser Gln
 20

<210> 73
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3D Peptide

<400> 73

Arg Ile Met Lys Val Glu Phe Thr Gln Cys Ser Met Asn Val Val Ser
 1 5 10 15

Lys Thr Leu Phe Gln
 20

<210> 74
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
 P3D Peptide

<400> 74

Phe	Thr	Gln	Cys	Ser	Met	Asn	Val	Val	Ser	Lys	Thr	Leu	Phe	Arg	Lys
1				5					10					15	

Ser	Pro	Ile	Tyr	Gln
				20

<210> 75

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 75

Met	Leu	Ser	Lys	Tyr	Ser	Leu	Pro	Ile	Val	Glu	Glu	Pro	Glu	Asp	Tyr
1				5					10					15	

Lys	Glu	Ala	Ser	Gln
				20

<210> 76

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 76

Leu	Asp	Glu	Asn	Gly	Leu	Leu	Leu	Gly	Val	His	Pro	Arg	Leu	Ala	Gln
1				5					10					15	

Arg	Ile	Leu	Phe	Gln
				20

<210> 77

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 77

Cys	Pro	Lys	Asp	Glu	Leu	Arg	Pro	Leu	Glu	Lys	Val	Leu	Glu	Ser	Lys
1				5					10					15	

Thr	Arg	Ala	Ile	Gln
				20

<210> 78

<211> 21

```
<400> 81
Asp Leu Asp Phe Ser Ala Phe Asp Ala Ser Leu Ser Pro Phe Met Ile
  1                      5                      10                      15
```

Arg Glu Ala Gly Gln
20

<210> 82
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 82
Ile Asn Asn Val Asn Leu Tyr Tyr Val Phe Ser Lys Ile Phe Gly Lys
1 5 10 15

Ser Pro Val Phe Gln
20

<210> 83
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 83
Gly Gln Lys Ile Val Asp Glu Phe Lys Lys Leu Gly Met Thr Ala Thr
1 5 10 15

Ser Ala Asp Lys Gln
20

<210> 84
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 84
Leu Gly Met Thr Ala Thr Ser Ala Asp Lys Asn Val Pro Gln Leu Lys
1 5 10 15

Pro Val Ser Glu Gln
20

<210> 85
<211> 21
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 85

Pro Gln Leu Lys Pro Val Ser Glu Leu Thr Phe Leu Lys Arg Ser Phe
1 5 10 15

Asn Leu Val Glu Gln
20

<210> 86

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 86

Ser Glu Lys Thr Ile Trp Ser Leu Ile Ala Trp Gln Arg Ser Asn Ala
1 5 10 15

Glu Phe Glu Gln
20

<210> 87

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 87

Ser Leu Ile Ala Trp Gln Arg Ser Asn Ala Glu Phe Glu Gln Asn Leu
1 5 10 15

Glu Asn Ala Gln
20

<210> 88

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic HAV
P3D Peptide

<400> 88

Trp Gln Arg Ser Asn Ala Glu Phe Glu Gln Asn Leu Glu Asn Ala Gln
1 5 10 15

Trp Phe Ala Phe Gln
20

<210> 89
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic
 Peptide

<400> 89
 Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala
 1 5 10 15

Ala Ala Ala Ala
 20

<210> 90
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic
 Peptide

<400> 90
 Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala
 1 5 10 15

Ala Ala Ala Ala Gln
 20

<210> 91
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic
 Peptide

<400> 91
 Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 1 5 10 15

Gly Gly Gly Gly
 20

<210> 92
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Synthetic
 Peptide

<400> 92

Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
1 5 10 15

Gly Gly Gly Gly Gln
20

<210> 93

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic
Peptide

<400> 93

Gly Gly Gly Gly Gly Ala Ala Ala Ala Ala Gly Gly Gly Gly Gly Ala
1 5 10 15

Ala Ala Ala Ala
20

<210> 94

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic
Peptide

<400> 94

Gly Gly Gly Gly Gly Ala Ala Ala Ala Ala Gly Gly Gly Gly Gly Ala
1 5 10 15

Ala Ala Ala Ala Gln
20